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SRI LANKA'S LOW-COST ENERGY SAVERS

by Mallika Wanigasundara

SRI LANKA, IDRC -- Energy swallows a very big chunk of Sri Lanka's national budget. The price of imported fossil fuels has escalated 300 percent in the last few years, and it has thrown the country's development budget completely out of gear.

In addition, the country's considerable capacity to generate cheap hydro-electric power is periodically negated by drought, which brings down the level of the reservoirs, as in the past year.

The energy component, whether in industry or agriculture, transport, communications, construction, or virtually any other form of economic activity, has been largely responsible for spiralling prices and the higher cost of living.

One of the agencies trying to make at least a dent in high energy costs is the National Engineering, Research and Development Centre (NERD). The Centre was established in 1974 to encourage the development, recognition, and promotion of indigenous technology suitable for local use. Built into its objectives is an effort to make maximum use of the country's human and material resources. Given the current situation, it is hardly surprising that NERD has been doing considerable work on energy saving devices and alternative sources of energy.

Research undertaken by the Centre to date includes the study of solar energy for low temperature water pre-heaters, cookers, driers, and stills; as

well as high temperature solar-powered boilers and furnaces. Dr A.N.S. Kulasinghe, Chairman of NERD, believes that solar energy can be used to run several of the country's industries. Windmills and biogas generators are also being tried out, and other NERD projects include the improvement of bullock carts, a low-cost gasifier, and production of charcoal from agricultural wastes.

From the kernel of the coconut are produced both dessicated coconut and copra (from which coconut oil is extracted). For both these purposes the coconut has to be dried. The energy for drying is usually obtained by burning coconut shells. But Dr Kulasinghe argues that solar energy could be harnessed for drying the coconut, and the shells saved for other energy purposes.

NERD has designed and built a solar drier for coconut kernel based on heat collected from the roof of the storage building. Solar-heated air is conducted into a chamber where the coconut is laid out in trays. The coconut dries very white and clean, unlike that dried by burning coconut shells. This type of drier can be installed for a 50-acre coconut plantation at a cost of about Rs25,000 (approx.US$1200). A large demonstration unit is now being built at NERD, and several coconut estates have been selected for testing the driers.

Once solar energy is used to dry the coconut, the shells can be used to produce gas to fuel internal combustion engines. NERD has developed a simple gasifier to convert materials such as coconut shells, coir fibre, rice husk, and wood into gas which can be used to run generators, pumps, factory machinery, boats, and even trucks. The prototype cost about Rs10,000 (US$480), one-tenth the price of an imported Swedish gasifier. NERD hopes to promote commercial production soon.

Another very cheap device being promoted by NERD is a low voltage (6-8 watt) fluorescent light for villages without electricity supply. These lights cost about Rs0.50 per night to run, one-third the cost of using kerosene lamps. They are powered by inexpensive, locally produced, rechargeable batteries. Every two weeks or so the battery needs recharging, so NERD has developed a small-scale windmill for this purpose. Costing around Rs4000 (US$190), the

windmill could be used to charge batteries for a group of houses. Twenty such windmills have already been manufactured.

Animal power is one of humanity's oldest sources of energy, but has been gradually going out of vogue in this automobile-oriented century. Since OPEC dealt its shattering blow, however, there has been some rethinking of well tried modes of transportation such as the bullock cart. NERD has now put on the road an improved cart that is cheap, easy to manufacture, and lasts longer than the traditional cart.

The improved cart combines the empirical wisdom of the traditional cartwright, and the engineering skills of the twentieth century. Dr Kulasinghe recognized that the traditional cart had some desirable features, such as the large diameter of the wheel. This has been incorporated into the modernised cart, but with steel rims and spokes. The boss is also of steel, and it has ball bearings to reduce friction

On the steel rim is a tyre of solid, cold-cured, vulcanised rubber, easy to fabricate locally. The tyre reduces wear and tear on the bituminised roads. The chassis and draw bar are made of laminated coconut wood. The end result is a lightweight, inexpensive cart that costs around Rs5000 (US$240), against Rs7500 (US$360) for the traditional cart. The various parts were fabricated in small local workshops to test their ability to manufacture the carts, which will be manufactured under license by local firms.

Even if the pace of life has quickened, says Dr Kulasinghe, rural people are seldom in too great a hurry. Which is why he believes that the improved bullock cart can give a new lease of life to the villages.

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